

4.1 Extreme Values of Functions

Extrema

local (relative)

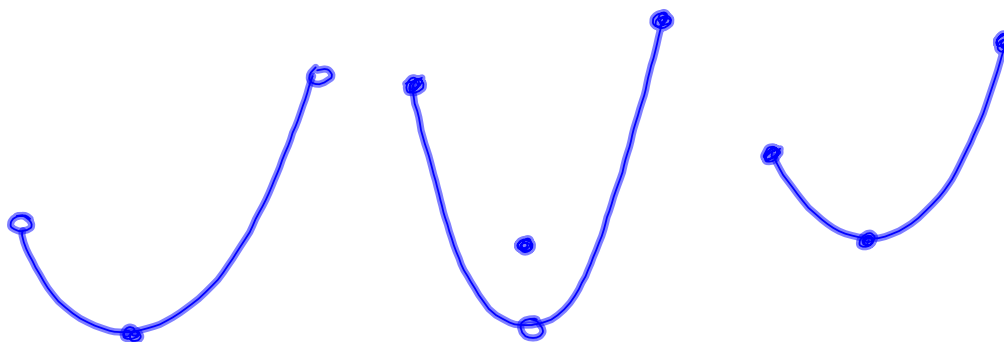
global (absolute)



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Extreme Value Theorem (EVT)

if f is continuous on the closed interval $[a, b]$, then f has both a max and a min on the interval.



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Candidates for max/min?

Critical points
endpoints

Candidates for extremes:

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Ex. Find the extrema for $f(x) = 3x^4 - 4x^3$ on $[-1, 2]$

endpts:
critical pts:

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Ex. Find the extrema for: $f(x) = 2x - 3x^{\frac{2}{3}}$ on $[-1, 3]$

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$$f(x) = \frac{1}{\sqrt{4-x^2}}$$

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$$f(x) = \begin{cases} 5 - 2x^2, & x \leq 1 \\ x + 2, & x > 1 \end{cases}$$

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